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US 4030397 A

(58) Field of Search

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ONLINE:WPI

(54) Abstract Title

Foot-operated musical instrument volume control

(57) A foot-operated musical instrument volume control unit which incorporates visible indication of its output signal level relative to its input signal level.

Control may be exerted in either a stepped manner, as illustrated by Figure 2, or in a continuous manner; both implementations allow fine control and maintain selected input/output signal level relationships.

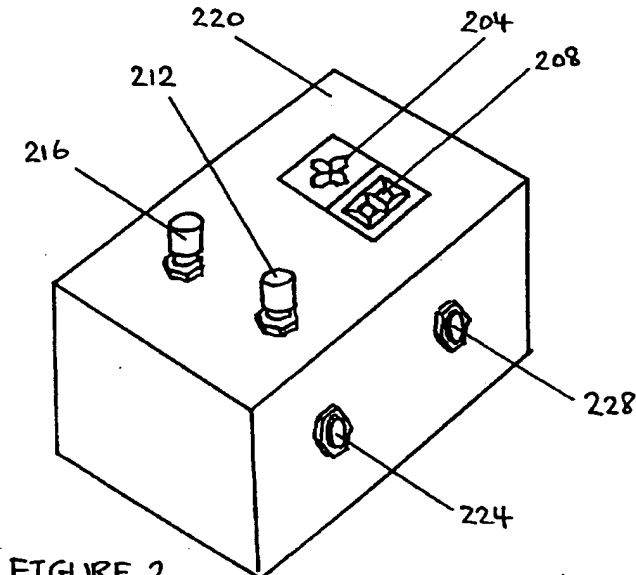


FIGURE 2

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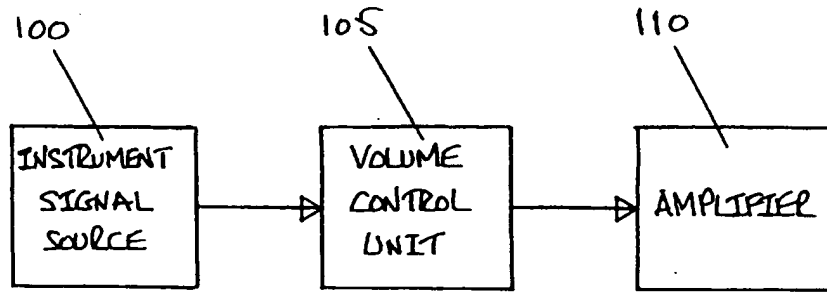


FIGURE 1

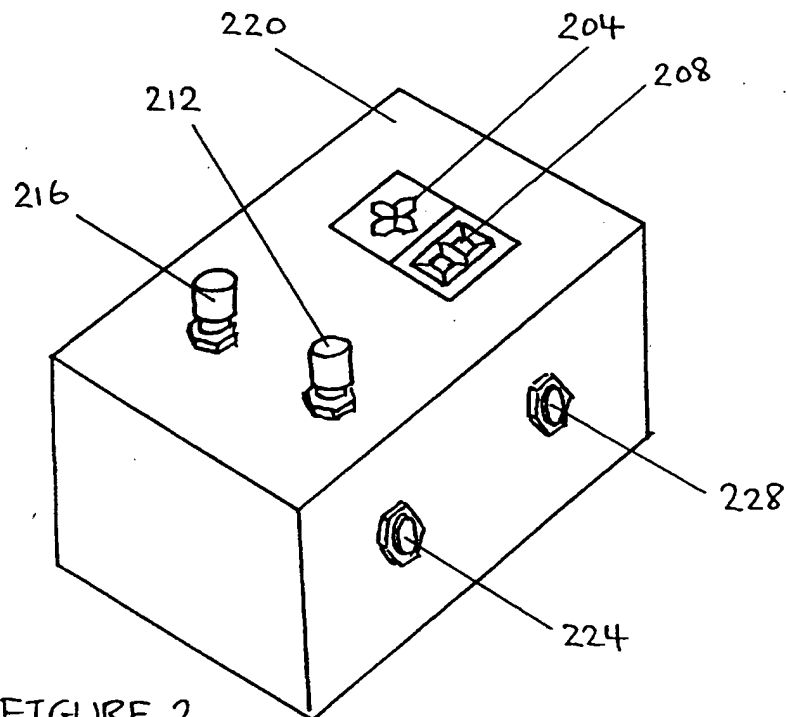


FIGURE 2

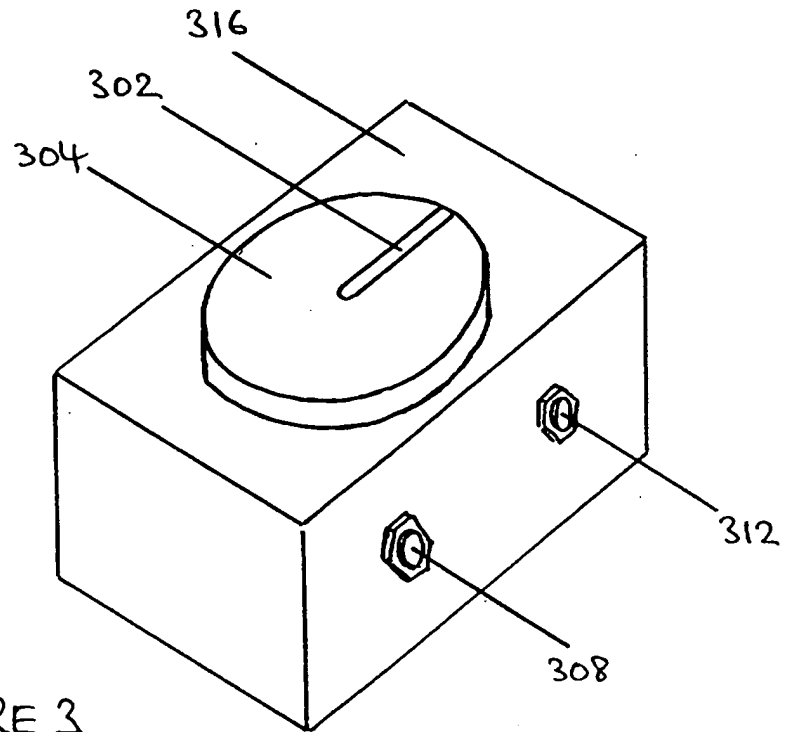


FIGURE 3

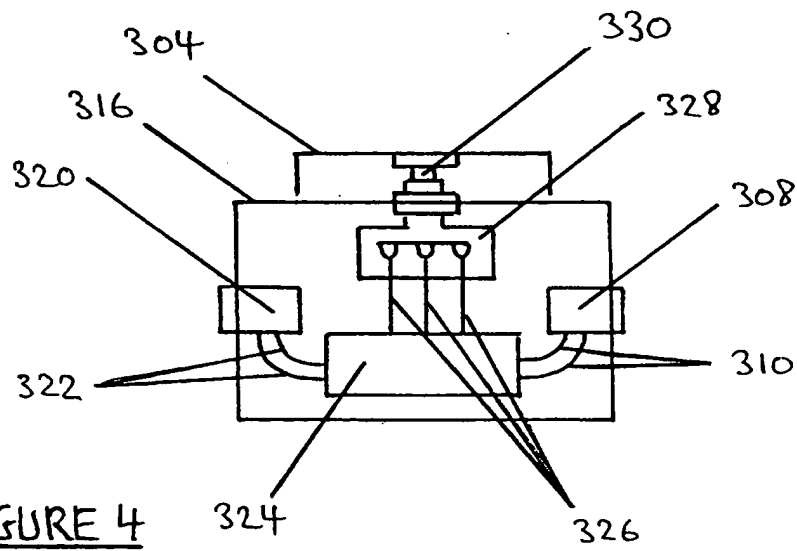


FIGURE 4

**2322744**

FOOT-OPERATED MUSICAL INSTRUMENT VOLUME CONTROL

This invention relates to musical instrument volume control by foot operation.

The dynamics of musical compositions often require that the relative loudness of individual instruments be varied at appropriate times during a performance.

Where a musical instrument either generates, or is used to generate, an electrical signal for power amplification, the loudness of the instrument may be adjusted with the volume control normally incorporated into the amplifiers used in these circumstances.

It is often convenient to introduce additional volume control into an amplification system in the form of a separate unit which allows variation of the level of the signal at its output relative to that at its input.

Commercially available volume control units are designed for foot operation, control being achieved by way of a pedal which pivots on a horizontal axis; variation of the angular position of the pedal in the vertical plane is contrived to change the output level of the signal.

The principal disadvantages of volume control units so described are as follows :

- a) It is difficult to predict the angular position of the pedal which will produce a required input/output signal level relationship; a positional change must be made first, and its effects then judged.
- b) It is difficult to exert fine control.
- c) Over a period of time the pivot mechanism can loosen, resulting in movement of the pedal under its own weight, with consequent unwanted change in the input/output signal level relationship.

According to the present invention there is provided a foot-operated musical instrument volume control unit which (a) incorporates visible indication of its output signal level relative to its input signal level, (b) allows fine control of the output signal level, and (c) maintains the selected input/output signal level relationship.

Two specific embodiments of the invention will now be described by way of example with reference to the accompanying drawings in which :

Figure 1 is a block diagram which shows a typical scheme involving a foot-operated musical instrument volume control unit;

Figure 2 shows in perspective, a foot-operated musical instrument volume control unit which provides stepped control of the output signal level;

Figure 3 shows in perspective, a foot-operated musical instrument volume control unit which provides continuously variable control of the output signal level;

Figure 4 shows in cross-section, a foot-operated musical instrument volume control unit which provides continuously variable control of the output signal level.

Referring to Figure 1, the volume control unit 105 is connected into the signal path between the instrument signal source 100 and the amplifier 110.

Referring to Figure 2, mounted in the top face of unit body 220 are '+/-' light emitting diode (LED) array 204, seven-segment LED array 208, 'UP' footswitch 216 and 'DOWN' footswitch 212.

The input signal enters the unit via socket 224, passes through an internal electronic circuit, and exits via another socket (not shown); power is supplied to the unit via socket 228.

Operation of the footswitches causes the internal electronics to increase or decrease the output signal level relative to that of the input; at any instant the LED's display one of the following :

-9,-8,-7,-6,-5,-4,-3,-2,-1,0,+1,+2,+3,+4,+5,+6,+7,+8,+9

A single footswitch operation steps the output signal level by a unit amount, the output level relative to that of the input being indicated by the value displayed. The arrangement allows fine control of the output signal level, and maintains the selected input/output signal level relationship.

Within the unit, the level variation is produced by a combination of digital and analogue electronic circuitry using standard techniques; buffer/driver circuitry is included in order to both preserve signal quality, and operate the LED's.

Referring to Figures 3 & 4, rotary potentiometer 328 is mounted in the top face of unit body 316 with its spindle 330 on a vertical axis. Attached to the spindle is control actuator 304, which is marked with radial position indicator 302.

The input signal enters the unit via socket 308, and is led to buffer/driver 324 by connecting wires 310; the output signal leaves the unit via socket 320, being led from the buffer/driver by connecting wires 322. The potentiometer connects to the buffer/driver via connecting wires 326; the unit receives its power via socket 312.

Rotation of the control actuator changes the level of the output signal relative to that of the input signal, by an amount which is indicated by the angle of rotation of the radial position indicator. The arrangement allows fine control of the output signal level, and maintains the selected input/output signal level relationship.

The level variation is produced by the well-known potential divider effect, and electronic buffer/driver circuitry is included in order to preserve signal quality.

CLAIMS

1 A foot-operated musical instrument volume control unit which (a) incorporates visible indication of its output signal level relative to its input signal level, (b) allows fine control of the output signal level, and (c) maintains the selected input/output signal level relationship.

2 A foot-operated musical instrument volume control unit as claimed in Claim 1 wherein volume control means are by operation of at least one switch.

3 A foot-operated musical instrument volume control unit as claimed in Claim 1 wherein volume control means are by operation of a control actuator connected to a spindle.

4 A foot-operated musical instrument volume control unit as claimed in Claim 1 or Claim 3 wherein visible indication of output signal level means are by position indicator on a control actuator.

5 A foot-operated musical instrument volume control unit as claimed in Claim 1 or Claim 2 or Claim 3 wherein visible indication of output signal level means are by light emitting diode array.

6 A foot-operated musical instrument volume control unit as described herein with reference to Figure 2.

7 A foot-operated musical instrument volume control unit as described herein with reference to Figures 3 & 4.



Application No: GB 9704307.9  
Claims searched: 1-7

Examiner: David Midgley  
Date of search: 19 May 1997

**Patents Act 1977**  
**Search Report under Section 17**

**Databases searched:**

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.O): H3G GSE

Int Cl (Ed.6): G10H 1/00 1/32 1/46

Other: ONLINE:WPI

**Documents considered to be relevant:**

Category	Identity of document and relevant passage	Relevant to claims
A	US 4030397 (NELSON)	1

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
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